



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,617	01/29/2004	Chen-Hsiung Cheng	9432-000158/DVC	5655

27572 7590 02/27/2007
HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER

ABOAGYE, MICHAEL

ART UNIT	PAPER NUMBER
----------	--------------

1725

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/27/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/767,617

Applicant(s)

CHENG ET AL.

Examiner

Michael Aboagye

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 24- 27 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 24-27 contain the new matter limitations "wherein a maximum tool pitch is less than fifty percent of average spot size; wherein the maximum tool pitch is no more than forty percent of average spot size; wherein the maximum tool pitch is no more than thirty percent of average spot size; wherein the maximum tool pitch is no more than twenty percent of average spot size". There is no support for these limitations in the disclosure.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Art Unit: 1725

4. Claims 20-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Aoki et al. (US Patent NO. 5,237,148).

Aoki et al teaches a laser-milled workpiece comprising a workpiece layer or ink-jet nozzle plate having an aperture or ink-jet nozzle formed therein by laser ablation of workpiece material; wherein the laser ablation is performed by a laser drilling system driving a laser beam according to a tool path across a surface of said workpiece layer, wherein the tool path has a constant arc speed (column 2, lines 45-50); wherein said nozzle plate forms part of an ink-jet head utilized in an ink-jet printer device (see abstract, column 1, lines 5-50; column 2, lines 11-61 and figures).

It is the examiner's position that the inkjet nozzle of Aoki et al. is identical to or only slightly different than the inkjet nozzle prepared by the (method or apparatus or system) of the claim(s), because both products have similar [apertures formed therein via laser ablation. Even though product-by-process claims are limited by and defined by the process (and product-by-apparatus/system claims are limited by and defined by the apparatus/system), determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production (or apparatus/system used for its production). If the product in the product-by-process (or product-by-apparatus/system) claim is the same as or an obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process (or different apparatus/system). *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The burden has been shifted to the applicant to show unobvious differences between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289, 292 (Fed. Cir. 1983). Aoki et al. either anticipated or strongly suggested the

Art Unit: 1725

claimed subject matter. It is noted that if the applicant intends to rely on Examples in the specification or in a submitted Declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with Aoki et al..

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Temple et al. (US Patent No. 6,228,311) in view of Zanomi (US Patent No. 3,961,838).

Temple et al. discloses a laser-milled workpiece comprising: a workpiece layer or ink-jet nozzle plate having an aperture or ink-jet nozzle formed therein by laser ablation

Art Unit: 1725

of workpiece material, wherein the laser ablation is performed by a laser drilling system driving a laser beam according to a tool path across a surface of said workpiece layer; wherein said nozzle plate forms part of an ink-jet head utilized in an ink-jet printer device (see abstract, column 2, line 1- column 3, line 64; and figures). Temple et al does not teach wherein the tool path has a constant arc speed.

However Zanomi teaches a system for producing and scanning laser beam, said system having a rotating mirror or a reflecting polygon arranged in the optical path and rotated uniformly by an electromagnetic transducer "6" to produce a laser beam of constant or uniform angular velocity which has broader utility in optical devices (column 2, lines 26-54; column 3, line 10- column 4, line 44 and figures 4 and 6).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to use a rotating mirror or a reflecting polygon in the optical path of the system of Temple et al. as taught by Zanomi in order to produce a laser beam of constant or uniform angular velocity (see, Zanomi: column 2, lines 26-32).

It is the examiner's position that the inkjet nozzle of Temple et al. in view of Zanomi is identical to or only slightly different than the inkjet nozzle prepared by the (method or apparatus or system) of the claim(s), because both products have similar [apertures formed therein via laser ablation. Even though product-by-process claims are limited by and defined by the process (and product-by-apparatus/system claims are limited by and defined by the apparatus/system), determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production (or apparatus/system used for its production). If the product in the product-

Art Unit: 1725

by-process (or product-by-apparatus/system) claim is the same as or an obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process (or different apparatus/system). *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The burden has been shifted to the applicant to show unobvious differences between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289, 292 (Fed. Cir. 1983). Temple et al. in view of Zanomi strongly suggested the claimed subject matter. It is noted that if the applicant intends to rely on Examples in the specification or in a submitted Declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with Temple et al. in view of Zanomi.

8. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Temple et al. (US Patent No. 6,228,311) in view of Yamakawa (US Patent No. 5,682,258).

Temple et al. discloses a laser-milled workpiece comprising: a workpiece layer or ink-jet nozzle plate having an aperture or ink-jet nozzle formed therein by laser ablation of workpiece material, wherein the laser ablation is performed by a laser drilling system driving a laser beam according to a tool path across a surface of said workpiece layer; wherein said nozzle plate forms part of an ink-jet head utilized in an ink-jet printer device (see abstract, column 2, line 1- column 3, line 64; and figures). Temple does not teach wherein the tool path has a constant arc speed.

However Yamakawa discloses an optical scanning system comprising F-Theta lens element arranged in the optical path for scanning the laser beam to a constant speed; said system not only small in size, but also provides a well corrected curvature of field, thereby lending itself to a broader applicability and utility in the field of laser printing and plate making (see, Yamakawa: column 1, lines 9- 46)

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to use a F-theta lens element in the optical system of Temple et al. as taught by Yamakawa in order to gain the benefit of having a laser scanning system of smaller size and well corrected curvature of field necessary for application in laser printing and plate making (see Yamakawa: column 1, lines 9 – 46).

It is the examiner's position that the inkjet nozzle of Temple et al. in view of Yamakawa is identical to or only slightly different than the inkjet nozzle prepared by the (method or apparatus or system) of the claim(s), because both products have similar [apertures formed therein via laser ablation. Even though product-by-process claims are limited by and defined by the process (and product-by-apparatus/system claims are limited by and defined by the apparatus/system), determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production (or apparatus/system used for its production). If the product in the product-by-process (or product-by-apparatus/system) claim is the same as or an obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process (or different apparatus/system). *In re Thorpe*, 227 USPQ 964, 966 (Fed. Cir. 1985). The burden has been shifted to the applicant to show unobvious differences between the claimed product and the prior art product. *In re*

Art Unit: 1725

Marosi, 218 USPQ 289, 292 (Fed. Cir. 1983). *Temple et al.* in view of *Yamakawa* strongly suggested the claimed subject matter. It is noted that if the applicant intends to rely on Examples in the specification or in a submitted Declaration to show non-obviousness, the applicant should clearly state how the Examples of the present invention are commensurate in scope with the claims and how the Comparative Examples are commensurate in scope with *Temple et al.* in view of *Yamakawa*.

9. Claims 24-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Aoki et al.* (US Patent NO. 5,237,148). in view of *Liu et al.* (US Patent No. 6,433,305~~8~~). *Aoki et al.* teaches the elements of claim ²⁰~~2~~ but do not expressly teach ultrafast laser or the relationship between the tool pitch and the spot size.

However *Liu et al.* teaches a material with laser drilled holes, by using ultrafast laser, wherein the pitch of the laser tool path is selected to be less than the laser beam spot size to prevent laser induced material hardening (*Liu et al.*, column 1, lines 38-67).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to set the pitch of the laser tool path in the system of *Aoki et al.* to be less than the laser beam spot size in view of the teachings of *Liu et al.* in order to prevent laser induced material hardening (*Liu et al.*, column 1, lines 38-67).

Response to Arguments

10. The examiner acknowledges the applicants' amendment received by USPTO on November 30, 2006. Claims 1-19 have been cancelled, New claims 24-28 have been added, therefore claims 20-28 are currently under consideration in the application.

11. Applicant's arguments filed November 30, 2006. have been fully considered but they are not persuasive. Claims 24-27, raise issues of new matter. Regarding the applicant's argument that neither Aoki et al. nor Temple teach a tool path that describes an arc. It is noted that the inkjet nozzle of either Aoki et al., or Temple is identical to the applicant's claimed article/ product, therefore the configuration of the laser drilled holes in the nozzle plates should also be identical, i.e. they describe a plurality^{of} holes formed on continuous concentric circles or spiral path. Furthermore, as discussed above, the product as claimed is not limited by the process limitations recited in claim 20.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 1725

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Aboagye whose telephone number is 571-272-8165. The examiner can normally be reached on Mon - Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AM
AM


Michael Aboagye
Assistant Examiner
Art unit 1725

02/22/2006

KEVIN KERNS
PRIMARY EXAMINER

Kevin/Kerna 2/24/06